ICP/EXT-05-01014
Revision 1

Waste Area Group 10 Annual Operations and Maintenance Report—FY 2005

February 2006

Idaho Cleanup Project

The Idaho Cleanup Project is operated for the
U.S. Department of Energy by CH2M◆WG Idaho, LLC

ICP/EXT-05-01014
Revision 1
Project No. 23368

Waste Area Group 10 Annual Operations and Maintenance Report—FY 2005

February 2006

Idaho Cleanup Project
Idaho Falls, Idaho 83415

Prepared for the
U.S. Department of Energy
Assistant Secretary for Environmental Management
Under DOE Idaho Operations Office
Contract DE-AC07-05ID14516

ABSTRACT

Annual Operable Unit 10-04 operations and maintenance activities were conducted in accordance with the *Operations and Maintenance Plan for Operable Units 6-05 and 10-04, Phase I*. The potential for unexploded ordnance had been reported along the southern flank of the Middle Butte at the Idaho National Laboratory. Further investigation and a walk-down of the area identified the remains of a small army encampment based upon the presence of a few old foxholes and spent rifle casings. The ordnance encountered consisted of eight spent incendiary-smoke bomblets (Type AN-M69). The explosive ordnance disposal personnel present during the walk-down determined that the bomblets did not pose an unacceptable risk to individuals or the environment; therefore, no action was taken to remove or dispose of the items.

CONTENTS

FIGURES

ACRONYMS

BLM	U.S. Bureau of Land Management
DOE-ID	U.S. Department of Energy Idaho Operations Office
FY	fiscal year
INL	Idaho National Laboratory
O&M	operations and maintenance
OU	operable unit
RDX	Royal Demolition Explosive
TNT	trinitrotoluene
USC	*United States Code*
UXO	unexploded ordnance
WAG	waste area group

Waste Area Group 10 Annual Operations and Maintenance Report—FY 2005

1. INTRODUCTION

In accordance with the *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory* (DOE-ID 1991), the U.S. Department of Energy Idaho Operations Office (DOE-ID) submits this annual Operations and Maintenance (O&M) Report for Fiscal Year (FY) 2005 to the U.S. Environmental Protection Agency and the Idaho Department of Environmental Quality. Remediation for Operable Units (OUs) 6-05 and 10-04 (hereinafter referred to as OU 10-04) at the Idaho National Laboratory (INL) is divided into four phases. Phase I consists of developing and implementing institutional controls at OU 10-04 sites and developing and implementing an INL Sitewide institutional controls plan and long-term ecological monitoring plan. Phase II will remediate sites contaminated with trinitrotoluene (TNT) and Royal Demolition Explosive (RDX). Phase III will remediate lead contamination at a gun range, and Phase IV will address hazards from unexploded ordnance (UXO).

As part of the Phase I requirements, the *Operations and Maintenance Plan for Operable Units 6-05 and 10-04, Phase I* (DOE-ID 2004) was developed, which describes the long-term activities and procedures required to satisfy the requirements of the *Record of Decision Experimental Breeder Reactor I/Boiling Water Reactor Experiment Area and Miscellaneous Sites, Operable Units 6-05 and 10-04* (DOE-ID 2002) and the *Operable Units 6-05 and 10-04, Experimental Breeder Reactor-I/Boiling Water Reactor Experiment Area and Miscellaneous Sites, Remedial Design/Remedial Action Scope of Work* (DOE-ID 2003) for Phase I remedial activities. Assessment, removal, in-place detonation, or isolation of surface ordnance and explosives—including UXO and TNT/RDX fragments identified during routine operations at the INL and that are determined through a safety assessment by explosive experts to pose an unacceptable near-term physical hazard—will be performed as part of the Phase I activities.

The basis for removal, in-place detonation, or isolation of ordnance and explosives determined to pose an unacceptable near-term physical hazard is a qualitative safety/hazard assessment that considers the likelihood of encounter with ordnance and explosives and the likelihood and severity of an unintentional detonation. The intent of such a removal action is to address imminent safety hazards and not to remediate conditions that can be deferred for future remedial action under either Phase II or Phase IV. Therefore, any removal or isolation of surface ordnance and explosives during Phase I O&M activities will not necessarily initiate a survey for detection and removal/isolation of other TNT/RDX fragments or UXO, as these actions will be performed during Phases II and IV, respectively.

Located 51 km (32 mi) west of Idaho Falls, Idaho, the INL is a government-owned, contractor-operated facility managed by the U.S. Department of Energy (Figure 1). Waste Area Group (WAG) 10, OU 10-04 includes miscellaneous INL Comprehensive Environmental Response, Compensation, and Liability Act (42 USC § 9601 et seq.) sites outside other WAGs at the INL (WAGs 1 through 9) that are associated with specific facilities. The ordnance areas associated with WAG 10 include three extensive artillery testing and bombing ranges used by the U.S. Navy and U.S. Army Air Corps during World War II. These include the Naval Gun Range, the Arco High-Altitude Bombing Range, and the Twin Buttes Bombing Range. Munitions used for bombing and target practice were generally inert, although the potential exists that some UXO could be present within the ranges.

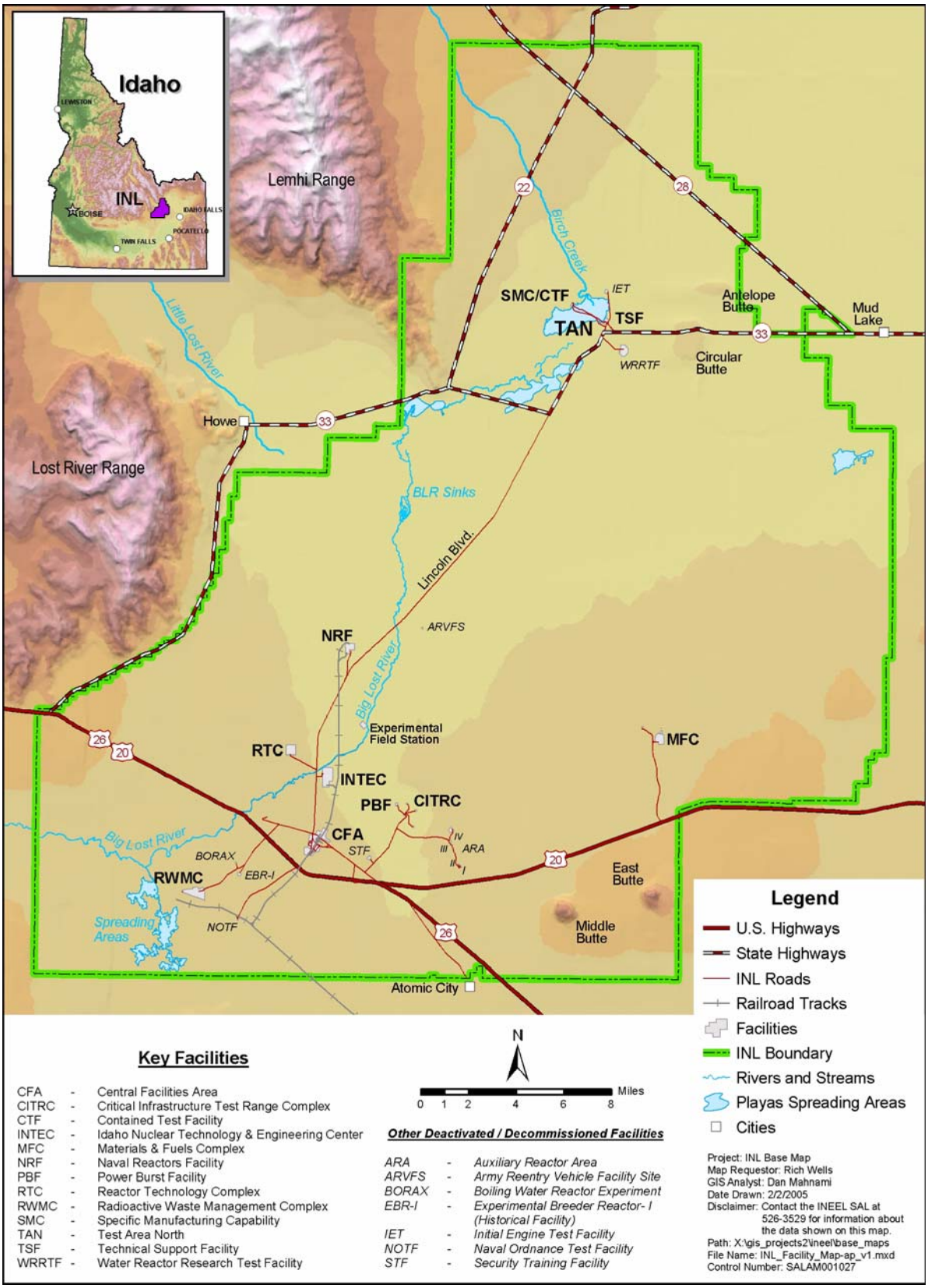

Figure 1. Idaho National Laboratory.

2. REQUIREMENTS

In accordance with the Phase I O&M Plan (DOE-ID 2004), interim removal, in-place detonation, or isolation of ordnance and explosives discovered during routine operations at the INL will be performed if they are determined by qualified explosive experts to pose an unacceptable near-term physical hazard. These interim removal, detonation, and isolation actions are intended to address only the imminent safety hazard posed by the presence of ordnance and explosives, not the cleanup requirements that can be deferred for later action in future OU 10-04 remediation phases.

Since the phased approach to remediation of OU 10-04 sites delays removal of ordnance and explosives from those sites identified in the Record of Decision (DOE-ID 2002), there is a potential for discovery of surface ordnance and explosives during routine operations (such as performing ecological monitoring, drilling new groundwater monitoring wells, and performing a site walk-down after a range fire) that could pose an unacceptable, imminent physical hazard to INL workers or the public before remediation of these areas is completed. Therefore, the Phase I O&M Plan (DOE-ID 2004) provides a mechanism whereby surface ordnance and explosives (which are determined by explosive experts to pose an imminent safety hazard before remediation of these areas can be completed) can be removed, detonated in place, or isolated such that the imminent risk is mitigated. The intent of removal, detonation, and isolation is to address only the near-term physical hazard and not contamination that can be safely deferred to the future remedial action phases. Thus, discovery of ordnance and explosives requiring evaluation for removal or isolation will not necessarily initiate efforts to detect, map, and remove potential ordnance and explosives near the ordnance and explosives identified for evaluation.

Ordnance and explosives determined to pose an imminent hazard will be removed, if safe to handle, and transported to the Mass Detonation Area for disposal by high-order detonation using additional explosives to initiate the detonation. If the explosive expert determines that the items cannot be safely transported, the UXO and explosives will be detonated in place. Alternatively, the ordnance and explosives will be isolated by establishing a signed and fenced or barricaded exclusion zone. Fencing may be considered for use in areas where live UXO is present, immediate or near-term removal cannot be performed, and where public and/or worker access to UXO could result in unintentional detonation.

3. FISCAL YEAR 2005 FIELD ACTIVITIES

During FY 2005, it had been reported to WAG 10 personnel that ordnance might potentially be in an area to the southwest of the Middle Butte. This area is located near the portion of the INL that is periodically used for grazing. The amount of INL land used for grazing varies from year to year, but approximately 60% of the INL is open to livestock grazing. No grazing is permitted within 0.5 mi of any primary facility area boundaries.

The U.S. Bureau of Land Management (BLM) grants and administers rights of way and grazing permits for INL lands. Thirty-four ranchers currently hold grazing permits on the INL with the BLM being responsible for managing and controlling grazing on the INL Site. In order to keep cattle and sheep away from facility areas or contaminated sites, grazing operators are provided with a map showing the areas in which grazing is allowed, and they are instructed to stay away from visible facility areas. Most of the cattle allotments are fenced; however, there are some areas where fences are not present. In years of abundant water (when the Big Lost River is flowing), both cattle and sheep are difficult to control. If cattle or sheep are found outside of the approved grazing areas, the U.S. Department of Energy notifies the BLM, and the BLM notifies the operators. Controlled hunting also is permitted on INL land, but it is restricted to 0.5 mi inside the boundary. The area of potential ordnance is near the southern boundary of the INL and is accessible by dirt roads from the south (see Figure 2).

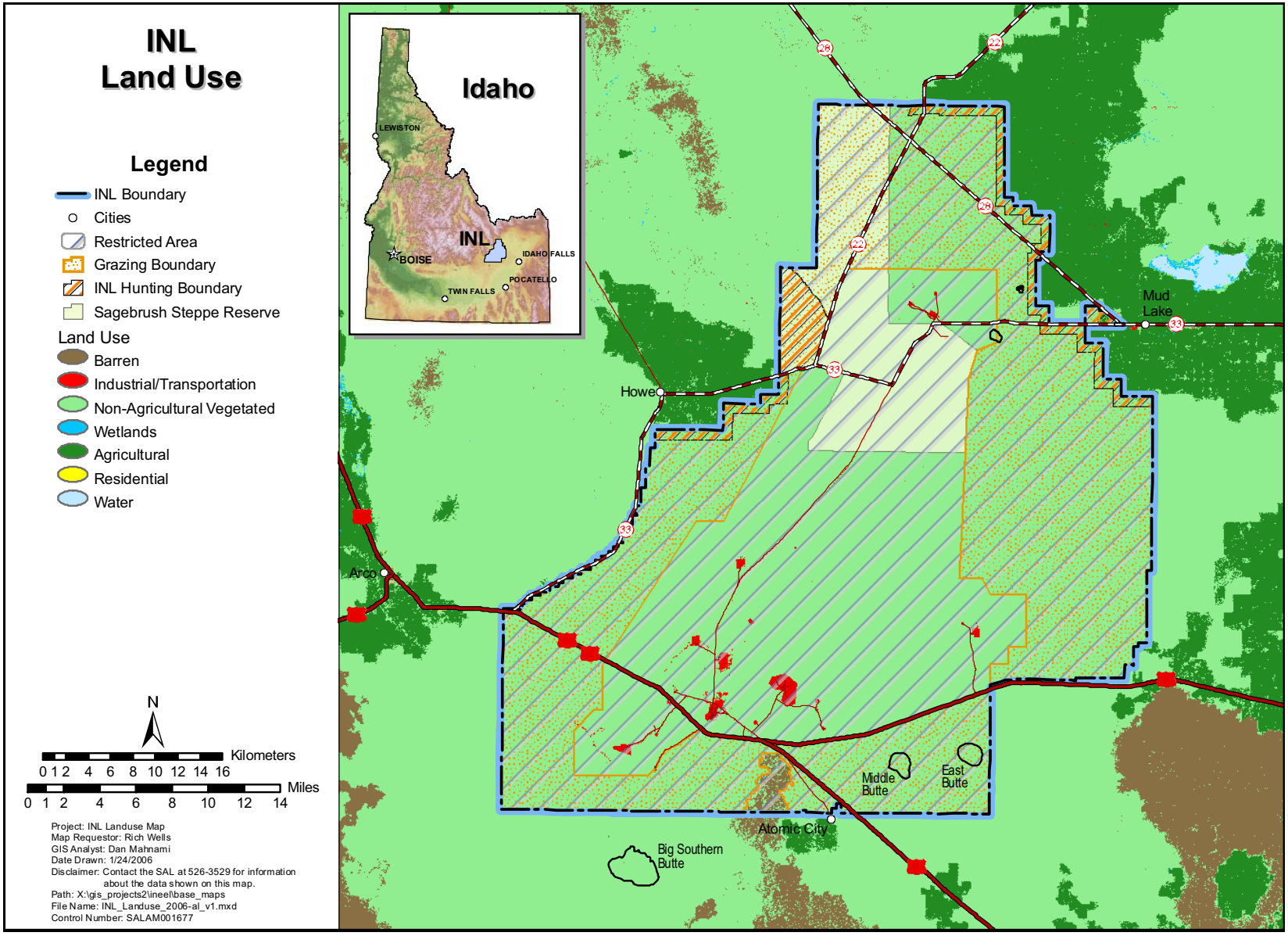

Figure 2. Site human and ecological land-use map.

A team was formed, including two explosive-ordnance disposal experts, to walk down the area and identify any ordnance that could pose an imminent risk to INL personnel or the public, given that the area lies near the southern boundary of the INL and within the established grazing area. A systematic approach was taken to walking down the area along the southern flank of the Middle Butte with personnel spaced approximately 10 m apart. The area appeared to have been used by a small contingent of armed forces personnel for training with remnants of a few foxholes present and spent rifle cartridges that appeared to have come from a .30-06, a rifle commonly used by the army. The walk-down proceeded from the vicinity where the bomblets were observed toward the Middle Butte based upon the possibility that personnel on the ground may have been involved in aircraft training runs with the Middle Butte as the target area. No other information is available that would indicate for what the area was used. Eight spent incendiary-smoke bomblets (Type AN-M69) were found during the walk-down (see Figures 3a, 3b, 3c, and 3d).

Figure 3a. AN-M69 Incendiary Bomblet No. 1.

Figure 3b. AN-M69 Incendiary Bomblet No. 2.

Figure 3c. AN-M69 Incendiary Bomblet No. 3.

Figure 3d. AN-M69 Incendiary Bomblet No. 4.

The construction of the AN-M69 incendiary bomblet's body consists of a hexagonal case with a nose cup welded to the forward end with an overall length of 19.5 in. and a diameter of 2.87 in. (see Figure 4). The nose cup, fuze, and powder charges are sealed off from the rest of the case by an impact diaphragm and plug held in a cup-shaped sealing diaphragm. The incendiary oil filling (2.8 lb of gelled gasoline) is held in a cheesecloth sack situated between the forward-sealing diaphragm and the tail cup. The total weight of the incendiary bomblet is 6.0 lb. The tail assembly consists of a tail cup, tail retainer, and disc. The tail cup is secured to the hexagonal case by beading, crimping, and heating. Four gauze streamers, each 54 in. long, are attached to the tail retainer by the tail disc to stabilize the bomblet and reduce the terminal velocity.

As shown in Figure 5, the bomblets were concentrated in an area bordered by an old dirt road on the southern flank of the Middle Butte. Figure 5 also shows the paths taken during the walk-down between the area where the bomblets were located and the Middle Butte to determine whether any other bomblets might have been dropped between the location and the butte. Although it is not shown on the map, personnel did scale the Middle Butte to determine whether any bomblets were located in the area. No other bomblets or signs of army activity were located outside the immediate vicinity where the bomblets were found.

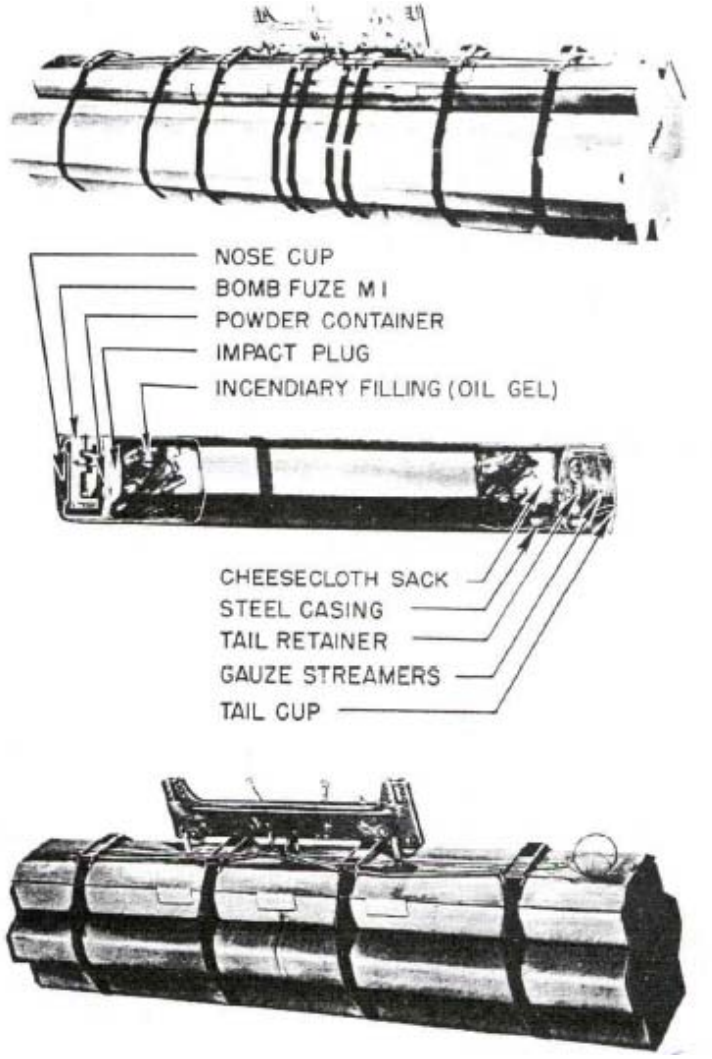

Figure 4. The 6-lb Incendiary Bomblet AN-M69 schematic.

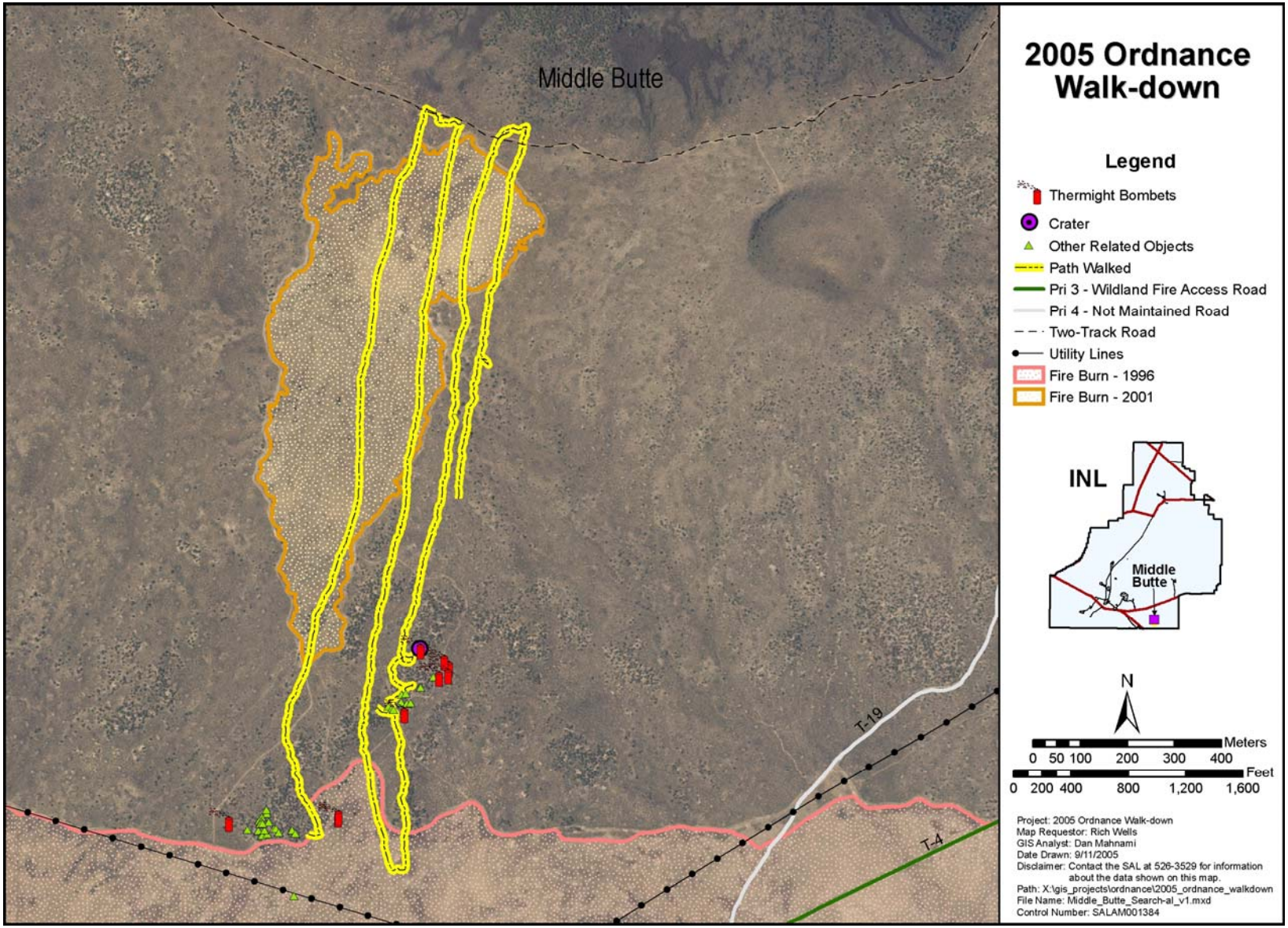

Figure 5. Location of incendiary bomblets.

4. SUMMARY

Eight spent AN-M69 incendiary bomblets were discovered during a walk-down of the southwestern flank of the Middle Butte at the INL. The walk-down was performed in accordance with the Phase I O&M Plan (DOE-ID 2004) as a follow-up to a reported sighting of UXO in the vicinity. The explosive ordnance disposal experts present during the walk-down determined that the bomblets no longer contained any of the incendiary filling; therefore, they did not pose an imminent risk to either individuals or the environment. Based upon this evaluation, no action was taken to remove or dispose of the materials. The area will be further evaluated during a future walk-down, either as part of the Phase IV remedial action or as a routine O&M activity.

5. REFERENCES

42 USC § 9601 et seq., 1980, "Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA/Superfund)," *United States Code,* December 11, 1980.

DOE-ID, 1991, *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory,* Administrative Docket No. 1088-06-29-120, U.S. Department of Energy Idaho Operations Office; U.S. Environmental Protection Agency, Region 10; Idaho Department of Health and Welfare, December 4, 1991.

DOE-ID, 2002, *Record of Decision Experimental Breeder Reactor-I/Boiling Water Reactor Experiment Area and Miscellaneous Sites,* DOE/ID-10980, Rev. 0, U.S. Department of Energy Idaho Operations Office, November 2002.

DOE-ID, 2003, *Operable Units 6-05 and 10-04, Experimental Breeder Reactor-I/Boiling Water Reactor Experiment Area and Miscellaneous Sites, Remedial Design/Remedial Action Scope of Work*, DOE/ID-11035, Rev. 0, U.S. Department of Energy Idaho Operations Office, February 2003.

DOE-ID, 2004, *Operations and Maintenance Plan for Operable Units 6-05 and 10-04, Phase I*, DOE/ID-11102, Rev. 1, U.S. Department of Energy Idaho Operations Office, February 2004.